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The Selection and conservation of a collection of nineteenth century architectural photographs

Douglas Severson

THE SELECTION AND CONSERVATION OF A COLLECTION OF NINETEENTH CENTURY ARCHITECTURAL PHOTOGRAPHS

Douglas G. Severson

Submitted in Partial Fulfillment of the Requirements
for the Degree MASTER OF FINE ARTS

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ROCHESTER INSTITUTE OF TECHNOLOGY
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Weston Kemp 5-3-84

Weston Kemp, Chairman
Associate Professor
School of Photographic Arts & Sciences, R.I.T.

James Reilly

James Reilly
Research Associate
School of Photographic Arts & Sciences, R.I.T.

David Travis

David Travis
Curator of Photography
Art Institute of Chicago

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The Selection and Conservation
of a Collection of
Nineteenth Century Architectural Photographs

I, Douglas G. Severson, prefer to be contacted each time a request for reproduction is made. I can be reached at the following address:

410 North Harvey
Oak Park, Illinois 60302

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INTRODUCTION

In the year 1904 the Ryerson Library of the Art Institute of Chicago began to acquire mounted photographic prints for study. These were predominantly architectural photographs, and were intended to supplement the library's fine collection of books and manuscripts on that subject. Acquisition of the materials continued until 1973, at which time the collection numbered approximately 30-35,000 photographs. By that time the museum had developed a slide library which contained most of the information in the print collection in the much more economical form of 35mm transparencies. This duplication (of visual information), along with a lack of adequate space to store the material, led to a decision on the part of the Ryerson Library to sell the print collection.

At this time (early 1981) I had finished all the course work in the M.F.A. program in Museum Studies at R.I.T. I had returned to Chicago to work part-time for the Photography Collection at the Art Institute of Chicago and to complete my graduate thesis, "A Study of Nineteenth Century Photographic Print Materials".

When I heard about the library's photograph collection and its pending sale, I saw an opportunity to

work with a vast amount of the material I wished to study. Arrangements were made with the library for me to examine the entire collection prior to its sale, and to transfer any photographs I selected to our department, the Photography Collection.

The initial examination of the prints took approximately a year and a half, working 1 or 2 days per week. Criteria were developed for making the selections based on image quality, didactic merit, and conservation usage. Eventually, 745 prints from the total of 30-35,000 were physically and administratively transferred to the Photography Collection. A more thorough examination of the chosen prints ensued in order to accurately identify them as to process and to determine their best use by our department. Finally, many of the photographs received conservation treatment and were rehoused in a manner appropriate to their projected use.

DISCUSSION

Description of Collection

I initially found the collection to be in rather deplorable condition in the basement of the Ryerson Library. Most of the prints were stored vertically in metal file cabinets, each of which also had a jumbled pile of loose prints lying on top. The 30,000 photographs were reasonably well organized according to geographic location. There was a predominance of European subjects, but nearly every country on earth was represented. Included were several hundred photographs of Chicago, but these I did not examine because the library had determined to keep these themselves.

The prints in the collection ranged from 3x5" to 17x22", and nearly all of them were attached to heavy cardboard mounts whose size ranged from 11x14" to 22x28". Frequently these mounts were embrittled to the point that their corners would break off under minimal pressure. There was no interleaving material between the photographs and they were often packed so tightly into the drawers that they could hardly be removed. Numerous examples could be found of nearly every form of deterioration that photographs undergo, including insect and mouse damage. But

there were also numerous pristine examples of most photographic and photomechanical processes.

The majority of the photographs were anonymous. Perhaps 25% of the collection was identified as to photographer, either on the negative or on the print.

The oldest prints were from the 1860's, although there were some later prints made from much earlier negatives. For example, there were some turn-of-the-century gelatin prints from paper negatives made in the 1850's for the Committee des Monuments Historiques. The most recent prints were from the 1930's, for instance, a series of interior views of steamship luxury liners. However, overall it was essentially a nineteenth century collection, as perhaps 75% of the prints were from the period 1865-1910.

Geographically the collection covered most of the known or "civilized" world of the nineteenth century. As mentioned, there was a predominance of European subjects, but there were also a large number of photographs from India, Persia, China, Russia, Japan, Africa, Australia, and even New Zealand.

The subject matter of the images was about 90% architectural. Most of these were very straight-forward topographical views of individual

buildings. But there were also a number of broad views of entire cities, such as a 3-print albumen panorama of the Mount of Olives by Félix Bonfils [see Figure 1]. Street scenes and harbor views were included, as were a number of noteworthy subgroups. For instance, there was a series of 15 large albumen prints of the Paris Opera, and another well crafted series of woodburytypes of the Chateau de Blois. The collection even included a group of 14 photographs of different styles of street lights in Paris [see figure 2]. [I was unable to determine whether these were part of a series known to have been made by Charles Marville.]

The remaining 10% of the photographs that did not depict architectural subjects were chiefly landscapes or portraits. For instance, there were several studies of olive trees in Greece and views of uninhabited Norwegian countryside. Many portraits of famous artists and architects could be found along with a few cabinet cards of unidentified sitters. And within each geographical category there was usually a section called "Customs & Manners" which comprised portraits of people in native dress or pursuing indigenous occupations, e.g. "Turkish coffee vendor" or "street dancers in Java".

An overall examination of the library's accession records indicated that the prints in the collection came to Ryerson from a variety of sources. The majority were purchased directly from the major publishing firms and printing houses of the nineteenth century, such as Alinari Brothers. Many other prints were given to the museum by wealthy patrons who had probably made the "Grand Tour" themselves and purchased the photographs on location. Others came directly from the photographers, such as a group of pictures of the Parthenon frieze by Walter Hege. Still others came from other institutions such as the Metropolitan Museum and the Boston Museum of Fine Art. Finally, there were some photographs purchased from travel-oriented publications, and even a few from the Ladies Home Journal.

Criteria for Making Selections

After examining enough of the collection to get a sense of what it contained, the following criteria evolved for making the selections:

I. Image Quality
   - Historic value
   - Aesthetic value

II. Didactic Merit
   - Process collection
   - Duplicate pairs

III. Conservation Usage
   - Deterioration phenomena
   - Samples for research and treatment

These will be discussed individually in the following sections.

Based on these criteria, 745 photographs were selected for transfer to the Photography Collection. These were distributed by size as follows:

580 prints on 11x14" mounts
52 prints on 13x17" mounts
44 prints on 17x22" mounts
69 prints on 22x28" mounts

Image Quality - Historic or Aesthetic Value

The "Grand Tour" phenomenon really began in the eighteenth century but reached its peak in the latter half of the nineteenth. This was a period when travel was considered an essential part of education for wealthy Britons and Americans, who would travel for months stopping at "all the required chapels of cultural approbation."[1] Usually this included Paris and the French cathedrals and chateaux, the Alps and the Swiss/Italian lake country, and Italy - especially Rome, Florence and Venice. More ambitious travelers might continue their pilgrimage to Jerusalem or Egypt. These tourists had a seemingly insatiable appetite for souvenir photographs - just as we do today. To meet this demand, intrepid photographers produced prints in all sizes of every tourist attraction they could find. Often considerable physical hardships and technical challenges were overcome. Indeed, given the difficulties of the work involved, the number of images produced is quite remarkable. Félix Bonfils boasted to the Société Française de Photographie in 1871 that he had already produced 15,000 prints and 9,000 stereo-

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[1] David Elliott, review of "The Grand Tour" exhibit at the Art Institute of Chicago. Chicago Sun-Times, 5 August 1979.

scopic views.[2]

Many photographers came to be quite well known as purveyors of these scenic views, and numerous prints were selected from the Ryerson Collection because they exemplified the work produced by these practioners. Included in this group are images by Francis Bedford, Giorgio Sommer, Francis Frith, Samuel Bourne, James Anderson, George Washington Wilson, James Valentine, and Felice or Antonio Beato [see Figures 3-9]. A more complete list of photographers identified in the collection is attached as Appendix A.

However, it was not unusual for one nineteenth century photographer to buy or trade for another's plates or prints and sell them as his own, so one can never entirely trust the identification on the image.

While those photographs described thus far were chosen essentially for their historic value, others were selected for some aesthetic quality of the image.

Many photographs in the collection simply record the building in front of the lens, but others are more sophisticated. Often it is appar-

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[2] Turner Browne and Elaine Parthnow, Photographic Artists and Innovators, (New York: Macmillan Pub. Co., 1983), p. 66.

ent that the photographer had a heightened awareness of the interplay of light and shadow in the image, how light falls on walls, objects, people. Indeed, photographs such as those in Figures 10-11 become pictures more of light itself than of the spaces it illuminates. Others make effective use of such simple devices as reflections and silhouettes [Figures 12-13].

Photography has been described as "the coincidence of object, light, and time recorded as a fixed image".[3] Several pictures were selected because they focus attention on time as an important aspect of architectural photography in the nineteenth century. George Washington Wilson is generally credited with making the first "instantaneous views" of street scenes with his photographs of Princes Street, Edinburgh in 1859. These were soon followed by Edward Anthony's street views of New York, Adolphe Braun's views of Paris and Valentine Blanchard's "snapshots" of London.[4] So by 1860, the technology to stop mo-

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3 David Travis, first page of unpaginated essay "Krzyzanowski the Timekeeper", Michel Szulc Srzyzanowski, Sequences, (Netherlands: Joh. Enschede en Zonen, 1984).

4 Helmut Gernsheim, The History of Photography, (London: Oxford Univ. Press, 1955), p. 202.

tion was widely known. But some photographers were unwilling and unable to use it, and others made a conscious choice not to, as can be seen from a comparison of Figures 14 and 15. In two nearly identical views of the Royal Exchange in London, one photographer has chosen to stop the action and produce a photograph as much of traffic congestion as of the building. In the other, the use of a long exposure has cleared the streets of all but a few blurred ghosts, and thereby produced an image with much greater emphasis on the architectural subject.

Another aspect of the nineteenth century viewmaker's aesthetic which can be studied in this collection is his attitude about scale. Relative size is clearly of great importance. The common technique of inserting an object of known dimension, such as a man or a meter stick, into the image area is frequently encountered. The visual significance of this approach can be seen by examining Figure 16. If the person at the bottom is cropped out with one's hand, there is an ambiguity of size which may appeal to our twentieth century tastes, but ran counter to the topographical purpose of the photographer.

A number of prints were selected simply for the unusual nature of their subject matter. For

instance, several anonymous views of the catacombs in Rome were found. While images like these may have been widely seen, they remain quite shocking when first encountered [Figure 17]. And three views of an Indian observatory seem at once playful and mysterious. [e.g. Figure 18].

Other photographs were chosen for the technical skill and craftsmanship they represent. An 18x22" albumen print which has been carefully composed, fully detailed, perfectly exposed, and properly printed and processed is no small accomplishment, as anyone who has made albumen prints can attest. More than a hundred such prints were located and set aside.

Accurate descriptive hand-coloring of photographs is a skill that naturally vanished with the advent of color photography. This collection included a series of somewhat faded but beautifully hand-colored photographs of Japan, many of which were selected solely for this reason [see Figure 19].

Didactic Merit - Process Collection

Each year hundreds of scholars, photographers, researchers, historians, students and other visitors come to the study room of the Photography Collection at the Art Institute of Chicago to view prints. Often questions arise as to the history, technical nature, and identification of the many different photographic processes that can be found in the permanent collection. It was felt that many of these questions could best be addressed by the formation of a Process Collection for use in the study room as an educational tool.

The 30,000 prints in the Ryerson Library collection included examples of most of the photographic and photomechanical print processes used during the nineteenth and early twentieth centuries. Therefore, one of the most important goals of this project was to use this resource to form the foundation of a permanent Process Collection.

This was accomplished by the selection of representative samples of the following 13 processes:

Albumen print
Albumen print hand-colored with water colors
Gelatin printing-out paper
Collodion printing-out paper
Matte collodion printing-out paper
Salted paper print
Platinum print
Gelatin developing-out paper
Gelatin developing-out paper hand-colored with water colors
Woodburytype
Carbon print
Collotype
Photogravure

There are several notable absences from this group, such as cyanotype and gum bichromate, which will be added when representative examples can be found. But at least a firm basis for the collection has been formed.

Process identifications were made using standard visual and microscopic examination techniques. Spot tests for binder solubility were used only to differentiate the gelatin and collodion printing-out papers. Several process identification guides and glossaries have been published and are listed in the bibliography, so no attempt will be made here to write yet another one.

The 13 prints in this group all received conservation treatment to some degree and were rehoused in an appropriate manner. This usually entailed mount removal and rematting, as will be described later in this report.

Didactic Merit - Duplicate Pairs

One of the most unique and valuable aspects of this collection was that many duplicate pairs of photographs could be found. Fifteen instances were found in which the same negative had been printed in two different photographic or photo-mechanical processes. Much can be learned from comparisons of this sort. Figures 20-21 show an albumen print and a gelatin develop-out print from the same negative. The superior tonal range of the albumen process is dramatically demonstrated as the shadow detail all but disappears in the gelatin print.

Another duplicate pair shows an albumen print and a gelatin printing-out paper print [see figures 22-23]. Since these are both printing-out processes in which the image is made up of photolytic rather than filamentary silver, the tonal range is approximately the same. But in this case the gelatin print looks better because of the increased tendancy toward discoloration of the albumen process.

The deterioration characteristics of the albumen process are clearly shown in several other duplicate pairs in which one print is in good condition and another print from the same negative

made by the same process is in very poor condition. Figures 24-25 show one albumen print with its original rich purple tones largely intact, and another which has undergone extensive fading and overall stain formation.

Comparisons such as these demonstrate the variabilities of photographic processes and the potential long-term effects of environmental conditions, mounting materials and storage enclosures on their stability.

Conservation Usage - Deterioration Phenomena

Like the medium of photography itself, the field of photographic conservation is relatively new. While paintings have been conserved and restored by professionals for hundreds of years, photographs have begun to receive similar attention only in the last decade. The number of proven safe and reversible restoration treatments that are applicable to photographs is very small, the techniques of analysis are largely unexplored, and the mechanisms of deterioration in photographs are very poorly understood. There is a real need for more research to be done for the conservation of photographs to proceed.

A sizable number of prints were selected from the library collection because they may prove useful in addressing these problems.

Silver images chemically deteriorate in most cases as a result of sulfiding (the reaction of silver with sulfur to form silver sulfide), or of oxidation (the conversion of metallic silver to colorless silver ions). In either case, the end result takes the form of fading, discoloration, and loss of highlight detail. Examples of this type of deterioration in each of its stages were selected from the collection, as were samples of

other chemical phenomena such as mirroring and glue stains [see Figure 26]. Mirroring is the metallic sheen that often appears in the shadow areas of gelatin develop-out prints. It is the result of oxidation followed by reduction of the silver ions back to the elemental state, but at a different particle site and in a different form. It is common in nearly all types of photographs that have a separate binder layer (gelatin, albumen, collodion), and is not safely reversible [see Figure 27].

Some forms of deterioration found in this collection occurred as a direct result of the fact that the prints were stored for years without interleaving in direct contact with each other, often pressed tightly together. Figure 28 shows a blue ink stamp which has transferred from the back of a mount to the surface of the adjacent print. Similarly, figures 29-30 show the yellow label that was affixed to the back of many of the mounts, and an image whose upper right corner has been locally stained by the direct contact with such a label.

Other examples were found that illustrated the physical, rather than chemical, damage that photographs often suffer. Cockling may occur as a result of poor mounting or drying initially, or

simply due to the stresses produced by fluctuating temperatures and humidities [see Figure 31]. Surface abrasions are a constant problem with any collection that must be handled, although some processes are more prone to such damage than others [see Figure 32].

Finally, perhaps the most severe conservation problem encountered with this collection is the poor quality of the mount boards to which the vast majority of the prints are attached. These mounts were made from wood pulp containing large amounts of groundwood and lignin, which stains, acidifies and embrittles paper. Surface pH readings were made on a number of mounts and were found to range from 2.5 to 5.0 (7 being neutral, 1 being most acidic). As shown in Figure 33, many of these brittle mounts had already lost corners or whole sections, greatly endangering the photographs attached to them.

These examples illustrate some of the types of deterioration found not only in this collection, but in any collection of nineteenth century photographs.

Conservation Usage - Samples for Research and Treatment

The deteriorated prints described above were kept principally to show as examples and warnings, and to discuss with visiting conservators, archivists, and scientists. But others were pulled for use in specific ongoing technical research projects in the Art Institute photography conservation laboratory.

One such project concerns the surface cracking of albumen prints. The binder layer of albumen photographs is prone to microscopic cracking or crazing from stresses imposed by humidity fluctuations, burnishing and many other causes. Photomicrographs of some of the different forms this cracking can assume are shown in Figures 34-37. Surfaces of prints such as these are usually badly soiled since the cracks tend to attract and entrap dirt particles. The only way such prints could be cleaned is by immersion in a water solution and yet it seems likely that the wetting and drying process would exaggerate the cracking problem still further. Is this true? Can it be measured and proven? Can the cracks somehow be relaxed and then restrained by the use of a consolidant?

This typifies the unsolved problems that exist in photographic conservation today and also

illustrates the type of research project for which many photographs in this collection were selected.

Summary of Procedures

The photographs selected for transfer to the Photography Collection have now been described according to the criteria mentioned. After the selection process was complete, the 745 prints were physically and administratively moved to the Photography Collection. They were temporarily housed in the conservation laboratory where the following procedures then took place.

The photographs were re-examined and resorted into more specific groups according to use. For instance the thirteen particular prints to be matted for the process collection were chosen from among the many pulled for that general purpose. Microscopic examinations were made with a Wild M7S stereomicroscope in order to make the process identifications with certainty, and to learn more about the condition of the prints. Determinations of the conservation needs of individual prints were made at this time. A Fisher Accumet Model 600 pH meter with a surface electrode was used to measure the surface pH of many of the mounts to help determine whether mount removal was warranted. But only if the condition of the mount was so poor that it posed a clear and immediate threat to the photograph would

dismounting be undertaken. If so, then the next evaluation to be made was whether wet or dry removal was appropriate. Wet removal (by immersion in distilled water) is generally the easier and more effective technique, but its use can be ruled out by a number of factors, such as the presence of surface cracking or of water-soluble colorants. With either removal method the backing or mount is delaminated and slowly removed from the photograph, rather than vice versa.

With some prints, the treatment required involved the patching of tears and voids. This was done with hand-made Japanese papers and methyl cellulose adhesive, in accordance with traditional paper conservation methods.

Finally, the prints were properly re-housed. For the Process Collection and some other prints, this entailed placing them in 4-ply all-rag overmats. Others were sleeved in mylar, undersize prints being first attached to an all-rag backing board with mylar corners. The photographs were then placed in either a solander case or an acid-free Hollinger box, and stored in an environmentally controlled vault at 60 degrees Fahrenheit and 40% R.H., or on baked enamel shelving in the air-conditioned conservation laboratory.

Conclusion

The execution of this thesis has differed in some of its details from the project as originally proposed. This was due to an unforeseen but very fortunate circumstance - namely the opportunity to work with this particular collection from the Ryerson Library. The original stated purpose "to study the history of photographic printing-out papers from the viewpoint of a conservator" could not have been better served. In educating one's eye there is no substitute for the examination of original prints, and this project has afforded that opportunity in excess. Much has been learned about geography, architecture, and history in addition to photographic imagery.

Perhaps more importantly, a great number of neglected and abused photographs have been saved from further deterioration and oblivion. Many of these images can now serve an instructive purpose (albeit a different one), as they were intended to from the outset.

The guidelines for the graduate thesis in the R.I.T. MFA Handbook emphasize the student's ability to propose a creative project, the technical competence to achieve it and the linguistic skills to describe it. These are

reasonable and relevent expectations but they could perhaps be expanded. Particularly in the Museum Practice area, it would seem important not only for the student to meet his own educational goals, but also for some service to be performed that is of significant value to a particular museum or collection, if not to the profession as a whole. It is hoped that this thesis has addressed itself to both of these purposes.

ILLUSTRATIONS

Fig. 1

Félix Bonfils. Mount of Olives, Jerusalem.
Three albumen prints mounted together.

Fig. 2

Anonymous. Street light in Paris.
Albumen print.

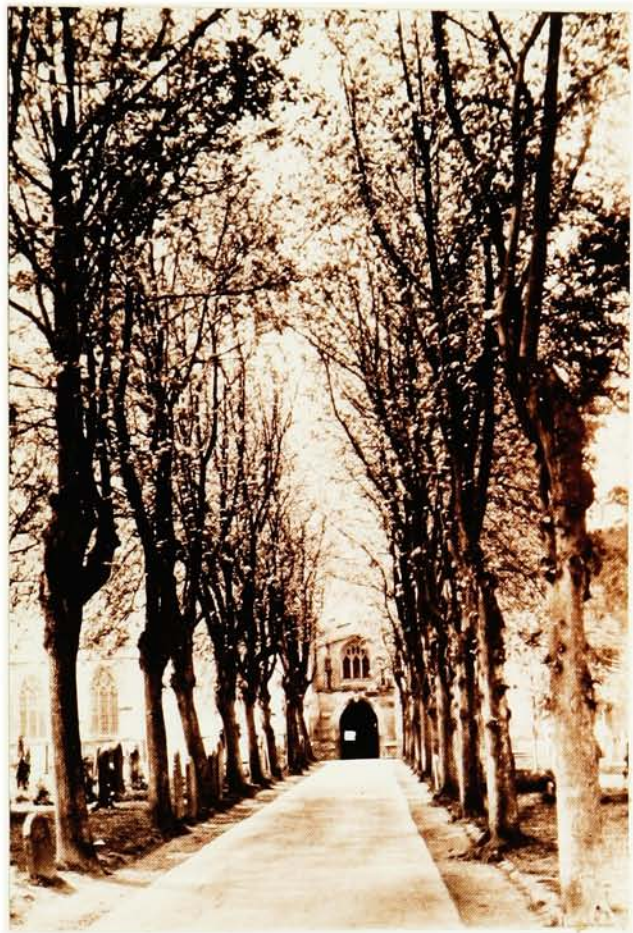


Fig. 3

Francis Bedford. Avenue to the church, Stratford-on-Avon. Albumen print.

Fig. 4 A. Beato. Denderah, Temple of Hathor.
Albumen print.

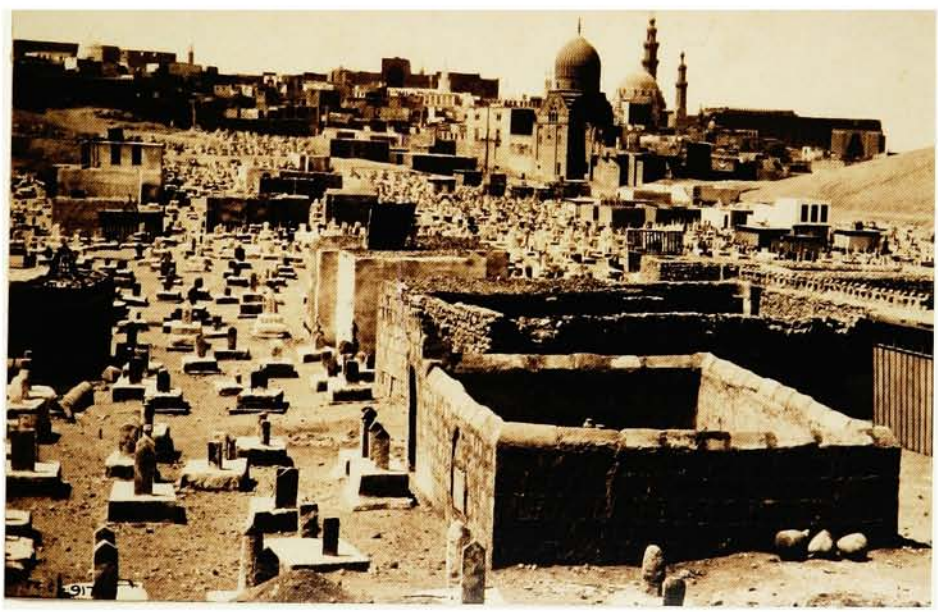


Fig. 5. Francis Frith. Arabian cemetery in Cairo.
Albumen print.

Fig. 6. Samuel Bourne. Vishnu Pud & other Temples, Benares.
Albumen print.

Fig. 7. James Valentine. Ely Cathedral from south.
Albumen print.

Fig. 8. George Washington Wilson. St. Mary's Abbey, York.
Albumen print.

Fig. 9. Giorgio Sommer. Naples, Italy.
Albumen print.

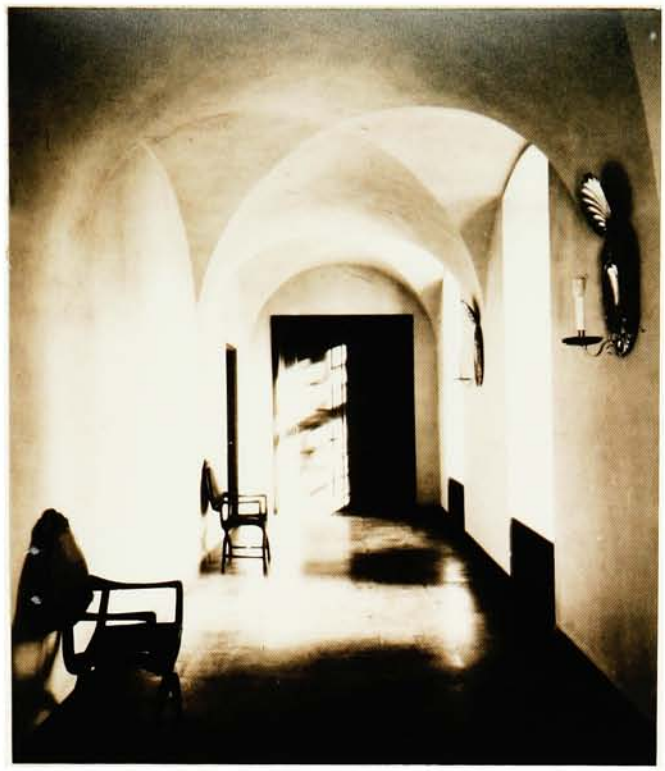


Fig. 10. Anonymous. Tillberg's house, Stockholm.
Gelatin develop-out print.

Fig. 11. Anonymous. Chateau de Blois.
Albumen print.

Fig. 12. Anonymous. Mosque of Sultan Achmed, Constantinople.
Albumen print.

Fig. 13. Anonymous. Trinity College & Bank of Ireland, Dublin.
Albumen print.

Fig. 14. Anonymous. Royal Exchange, London.
Albumen print.

Fig. 15. Anonymous. Royal Exchange, London.
Albumen print.

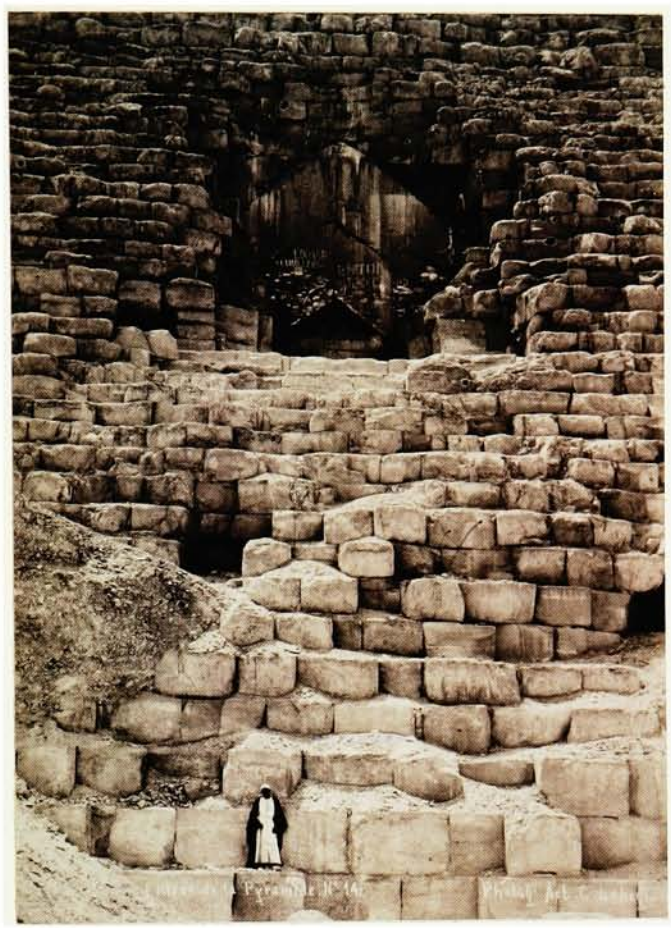


Fig. 16

G. Lekegian. Pyramid of Cheops, Gizeh.
Albumen print.

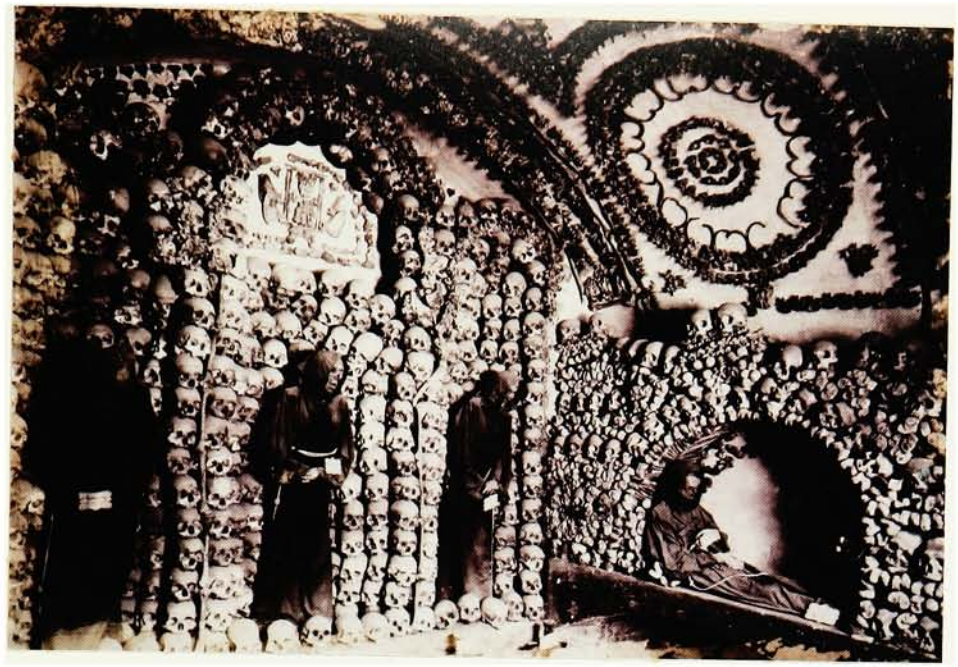


Fig. 17. Anonymous. Capuchin chamber, catacombs, Rome.
Albumen print.

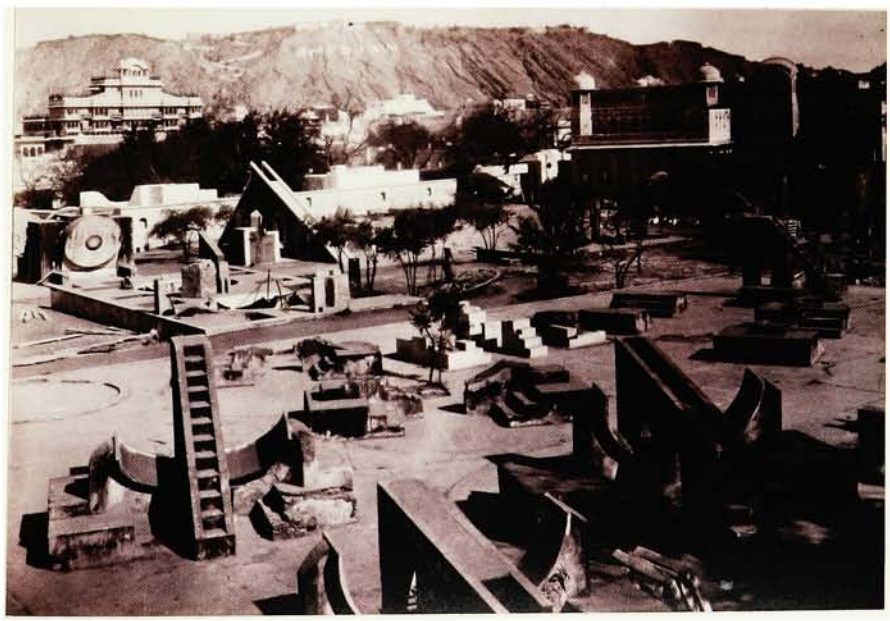


Fig. 18. Anonymous. Observatory in Jaipur, India.
Albumen print.

Fig. 19

Anonymous. Ginkakuji, Kioto, Japan.
Hand-colored albumen print.

Fig. 20

James Anderson. Colosseum, Rome.
Albumen print.

Fig. 21

James Anderson, Colosseum, Rome.
Gelatin develop-out print.

Fig. 22

Anonymous. Jacques Coeur house, Bourges.
Albumen print.

Fig. 23

Anonymous. Jacques Coeur house, Bourges.
Albumen print.

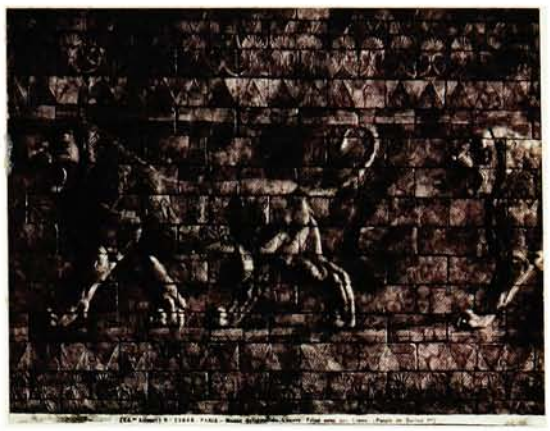


Fig. 24

Alinari Bros. Persian frieze
from Palace of Darius I.
Albumen print.

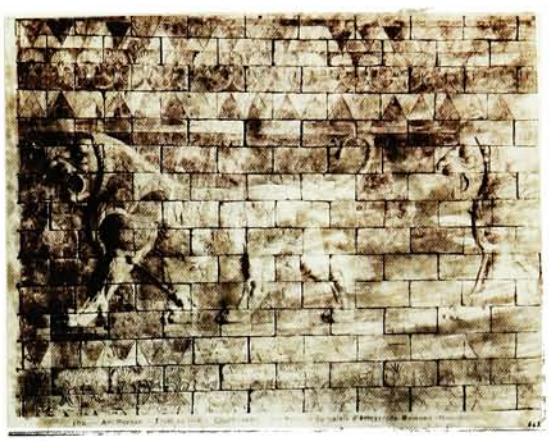


Fig. 25

Alinari Bros. Persian frieze
from Palace of Darius I.
Albumen print.

Fig. 26. Anonymous. Tower in Tunis.
Albumen print with glue stains.

Fig. 27. Anonymous. Sorrento, Italy.
Gelatin develop-out print with mirroring.

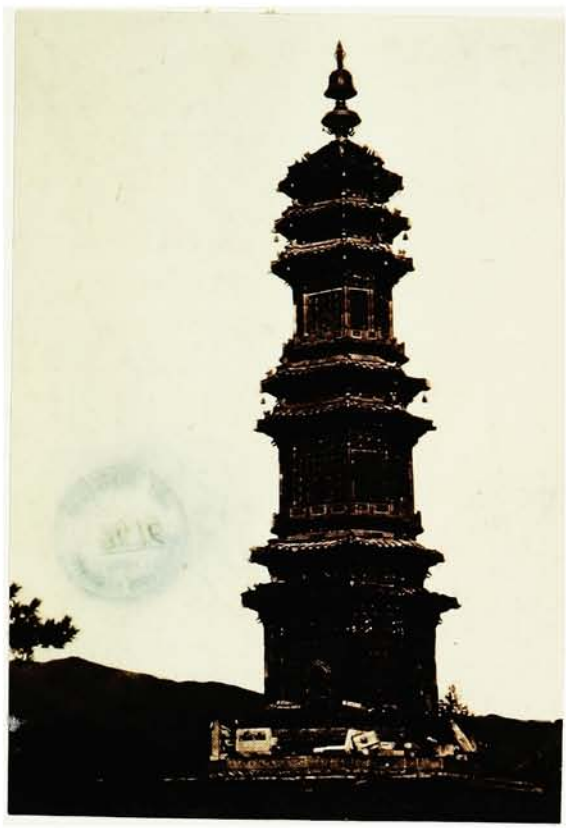
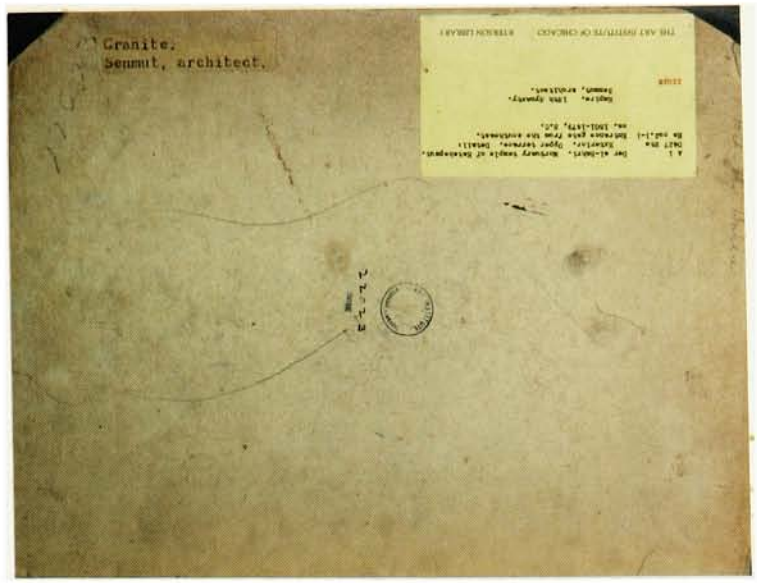


Fig. 28

Anonymous.
Porcelain Tower, Peiping, China.
Albumen print with ink transfer.



Fig, 29. Yellow label on mount verso.

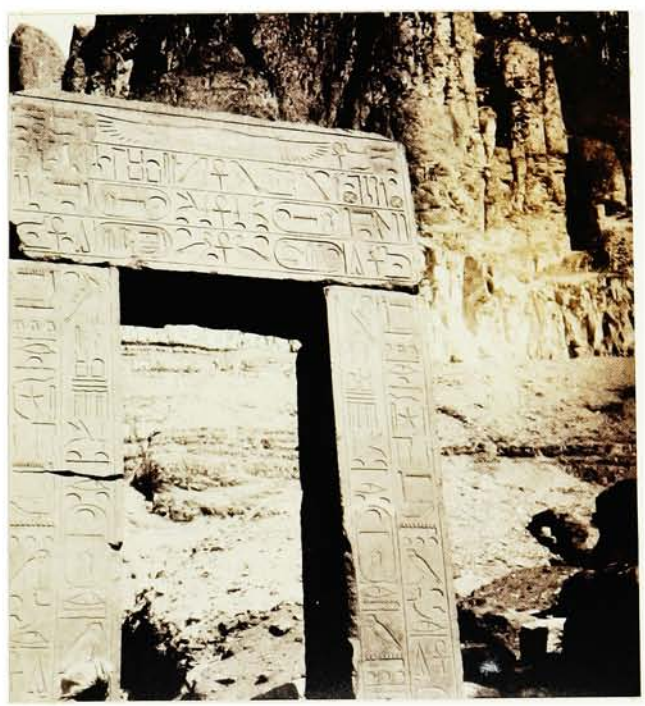


Fig. 30. Anonymous. Temple at Der el-Bahri.
Albumen print with localized stain from label.

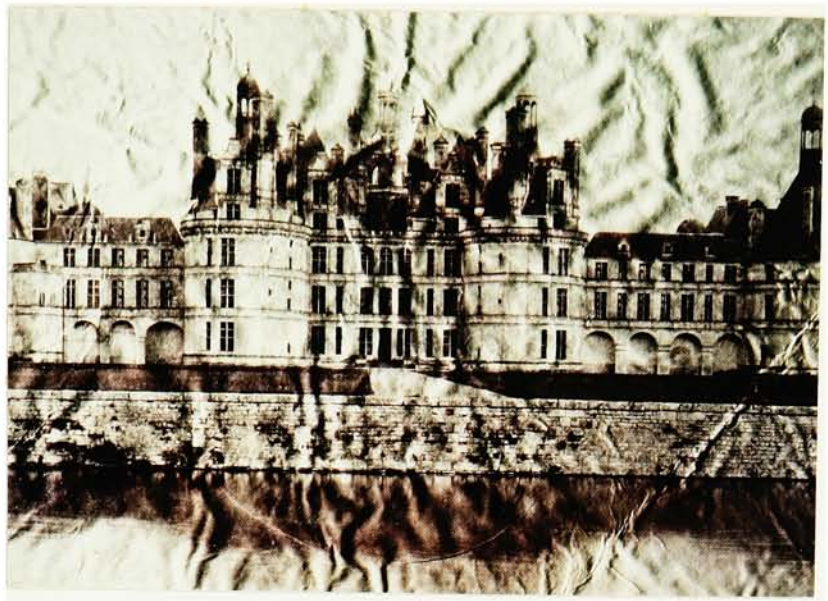


Fig. 31. Anonymous. Chateau de Chambord.
Albumen print with severe cockling.

Fig. 32. Photomicrograph of abrasions on
surface of matte collodion print (15X).

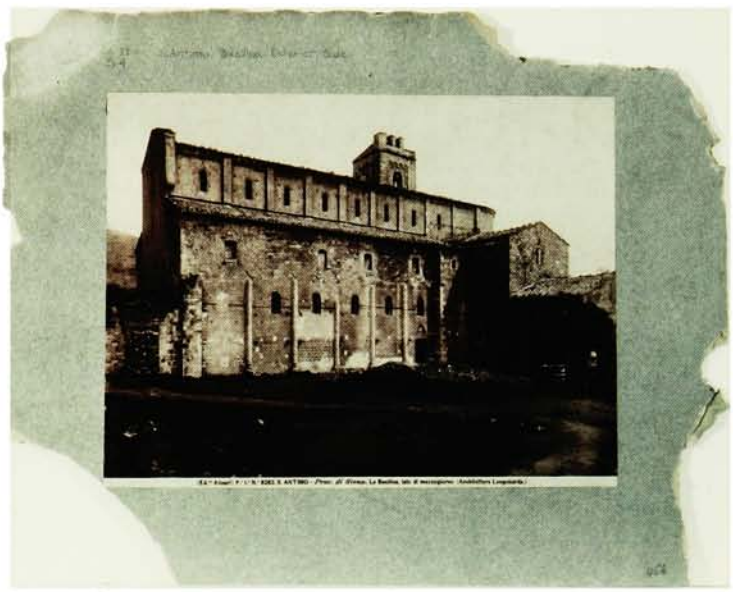


Fig. 33

Alinari Brothers.
Basilica at San Antimo.

Albumen print on
brittle mount.

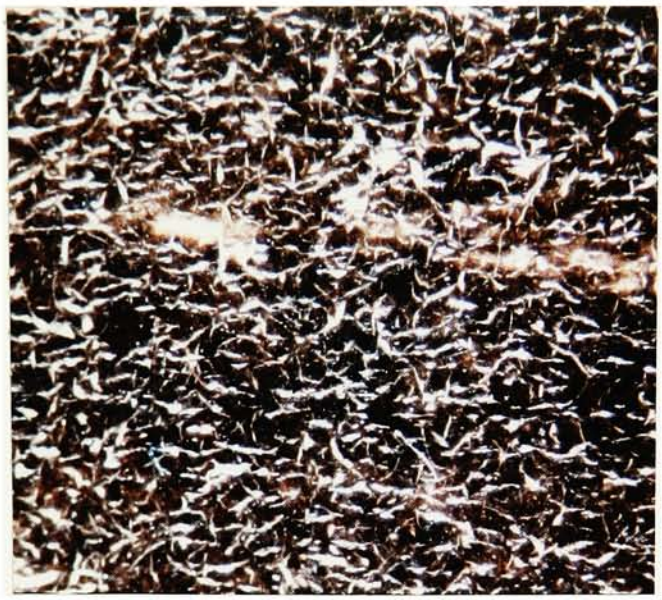


Fig. 34. Photomicrograph of random cracking on surface of albumen print (10X).

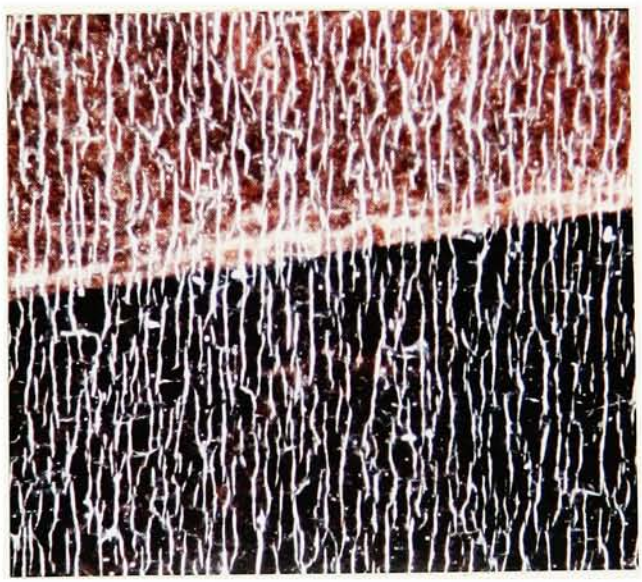


Fig. 35. Photomicrograph of directional cracking on surface of albumen print (10X).

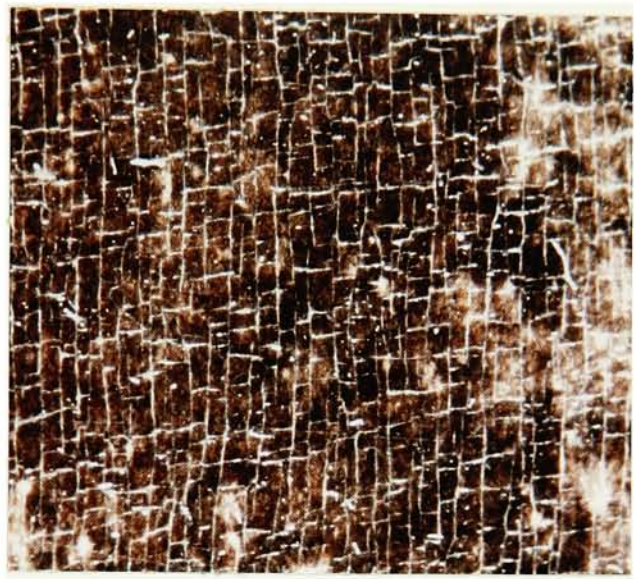


Fig. 36. Photomicrograph of rectangular cracking on surface of albumen print (10X).

Fig. 37. Photomicrograph of blister cracking on surface of albumen print (10X).

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APPENDIX A

Partial List of Photographers Identified in Collection

Abdullah, Freres
Alinari, Giuseppe and Leopoldo
Anderson, James
Beato, Antonio or Felice
Bedford, Francis
Berggren, G.
Bonfils, Félix
Bourne, Samuel
Burke, James E.
Frith, Francis
Gerard, Charles
Hege, Walter
King, Horatio Nelson
Knudsen, K.
Lekegian, G.
Sebah, Pascal
Skutta, C.
Slingsby, Robert
Sommer, Giorgio
Taylor, J.W.
Valentine, James
Wilson, George Washington

APPENDIX B

Photographs Exhibited at
Rochester Institute of Technology
March, 1984

A. Beato, c.1880
Denderah, Temple of Hathor
Albumen print

Anonymous, c.1880
Kaser Said, Algeria
Albumen print

Anonymous, c.1880
Girl in doorway in Algiers
Albumen print

Anonymous, c.1875
Observatory in Jaipur, India
Albumen print

George Washington Wilson, c.1880
Melrose Abbey, north transept and chancel
Albumen print

Anonymous, c.1870
Capuchin chamber, catacombs, Rome
Albumen print

Garzon, c.1885
Alhambra-entrance to the courtyard
Albumen print

APPENDIX C

Thesis Proposal

Submitted and approved October, 1980.

Title: "A Study of Nineteenth Century Photographic Print Materials"

Statement of Purpose:

I intend to study the history of photographic printing-out papers from the viewpoint of a conservator. Historical and experimental research will be conducted to provide information on possible storage conditions and restoration treatments for these materials.

Background Information

I came to the Museum Practice program at R.I.T. in 1979, after completing a master's degree in photography at the Institute of Design in Chicago. My principal interest had turned from my own image-making to the conservation of photographs. I felt that the program at R.I.T. offered a unique opportunity to study this field, through the internship at George Eastman House and the technical expertise and facilities available at the school. By taking full advantage of these resources I have learned much about the state of the art of photographic conservation, and about my own capabilities and limitations.

Clearly there is a burgeoning interest in the collection of photographs. Public interest in and institutional awareness of the problems of preservation and restoration is growing. But

relatively little work has yet been done on the physical nature of early printing materials, and the history of their use by fine art photographers. There are literally millions of photographs on nineteenth century printing-out papers in museums, libraries, and private collections. The historical and aesthetic information which resides in these prints is slowly but steadily disappearing, due to physical abuse, poor storage conditions, and the inherent instability of the materials. There is a great need for research in this area if these photographs are to be preserved.

James Reilly has begun to investigate the mechanisms of deterioration in albumen prints in an ongoing research project at R.I.T. My involvement with the project has given me an understanding of the materials and has made me aware of several questions outside the scope of Mr. Reilly's work, which are ripe for investigation. One such area concerns the physical (as opposed to optical) manifestations of deterioration in albumen and other nineteenth century printing-out papers. Mr. Reilly is examining visual problems such as highlight yellowing and image fading, but neither he nor any other investigator has dealt with the problems of surface cracking and dimensional stability. Information about the causes and consequences of these phenomena is essential for both adequate storage and responsible conservation treatment. Experimental investigation of this question would naturally have to be based on extensive historical research. I propose to conduct such research.

Procedure

This project shall be done chiefly under the auspices of the Photography Department at the Art Institute of Chicago. I have been given an opportunity to come to the department at a time of great expansion and transition. Plans are being finalized for the complete remodeling of a large area of the museum, to be given over entirely to the Photography Department. The new facility will include a well-equipped conservation lab, darkroom, and cold storage vault in addition to the print study room, offices, and galleries. To witness and participate in this transition should be an invaluable museum experience in its own right.

Since the completion of the new lab is not anticipated until late 1981, the historical component of the project shall be pursued for at least 6-8 months. This would entail examining prints, early handbooks and manuals, and old photographic journals. I would concentrate on such questions as how original nineteenth century prints that now exhibit physical lproblems were made, and what types of paper and methods of coating and processing were used. I havve already begun this work in the archives at Eastman House and would continue it in Chicago with the holdings of the Art Institute and the University of Chicago and John Crerar libraries. It may be of interest to compare the condition of certain albums and photographs which exist in both collections, Eastman House and the Art Institute, for instance Frith's Egypt and Palestine, Gardner's Sketch Book, and Fenton's Photographs Taken in the Crimea. This might provide information, however inexact, about the effects of differing storage conditions, assuming the provenance of the items could be at least partially traced. At any rate, I would anticipate occasional visits to Rochester for various reasons.

When the historical research produces questions to be answered experimentally, attempts will be made to do so. This may involve such things as the design and execution of experiments to study the effect of storage at various temperatures and humidities on the surface characteristics of prints. I have some experience with this type of testing, but I would not hesitate to seek the advice of others. These would include working photographic conservators such as Alice Swan and David Kolody; researchers such as Siegfried Rempel at the Canadian Conservation Institute; experts on paper technology such as Joseph Brown at R.I.T.; and experts on experimental design such as Irving Pobboravsky at the Graphic Arts Research Center. My principal advisors on the history of photography and the basic conduct of the thesis would be my board member.

I would anticipate completion of the project in late 1981. It is difficult to predict what type of thesis display would be most appropriate, but an exhibition of historical prints illustrating some of the processes and problems studied might be possible. Also, I would hope that my conclusions would be worthy of publication in an appropriate conservation journal, such as Restaurator or the Bulletin of the American Institute for Conservation.